FAA | AVIATION NEWS

JULY 1965

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FAA | AVIATION NEWS

F E D E R A L A V I A T I O N A G E N C Y

VOL. 4, NO. 3 JULY 1965

COVER

William F. McKee, with his wife and son in attendance, is sworn in as administrator of the Federal Aviation Agency in a ceremony at the White House, July 1, 1965.

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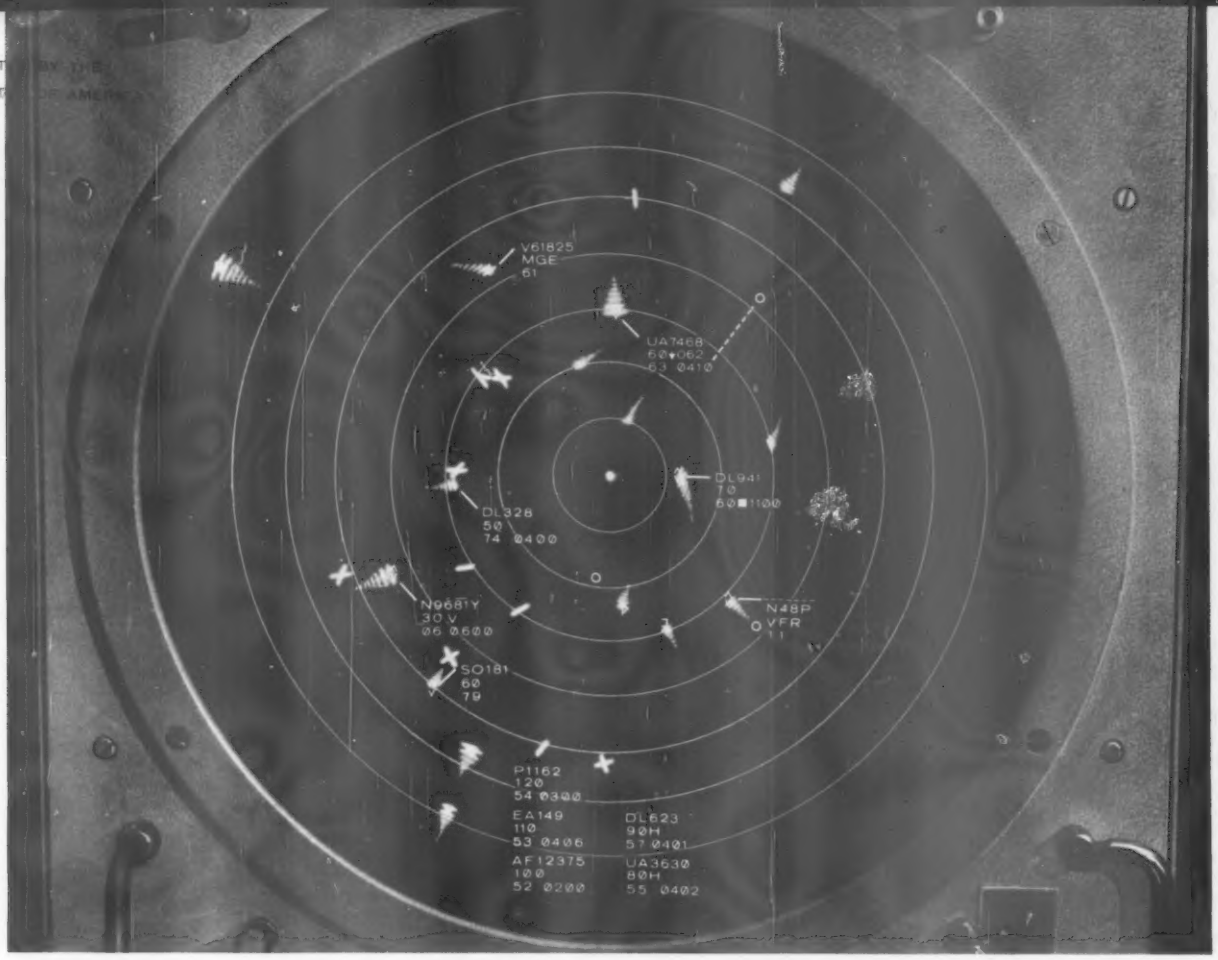


FAA BEGINS FIELD TRIALS OF ADVANCED RADAR TECHNIQUES

Year-long field trials of new techniques in air traffic control using computerized equipment that can for the first time provide controllers with a constant "three dimensional" radar picture of traffic along the nation's airways, have been announced by the FAA.

The trial consists of two parts. The operational test of the Advanced Radar Traffic Control System (ARTS) is being conducted in the airport control tower, Atlanta. The test of Stored Program Alpha-Numerics (SPAN) is being conducted in the high altitude portion of the air route traffic control center at Indianapolis.

FAA Administrator N. E. Halaby described ARTS and SPAN as significant steps in the science of air traffic control. He said, "The results of the year-long evaluations will have a profound impact on the efficiency and safety of the future national airspace system."

In both tests aircraft radar blips will be electronically "tagged" with luminous letters and numerals (alpha-numerics) which are grouped in rectangular shaped tags (data blocks). The tag will then follow the aircraft radar blip across the air traffic controller's radar screen, providing the controller with vital flight information. A computer track number is assigned to each participating aircraft.

The computer-driven ARTS and SPAN equipment will automatically display in the alpha-numeric tag not only continuous identity, but also the actual altitude for those aircraft equipped with automatic altitude reporting transponders.

Furthermore, the altitude will, like milage increments on an odometer, be ticked off at each 100-foot level as the plane climbs or descends. On aircraft not equipped for automatic altitude reporting, the controller may manually insert into the alpha-numeric tag the pilot's assigned altitude or his altitude as last reported by radio.

Neither ARTS nor SPAN has previously been tested in an actual air traffic environment, although the equipment has been successfully "bench tested."

Side by side operation of both new and existing equipment will permit comparisons as well as limited experimentation with the new equipment while assuring safe and efficient air traffic control during the trials.

The above photo indicates how alpha-numerics appears on an ARTS radar scope. Retouched to eliminate distortion, the photo is similar to what the controller actually sees. The blips representing actual aircraft are cone-shaped; some have alpha-numerics tags attached; others do not. The other blips—cross marks, circles and dashes—represent aeronautical reference points such as radio navigation aids and intersecting air routes.

The blip near the top center indicates United Airlines 7468, cleared to 6,000 feet and now descending through 6,200 feet. Its computer track number is 63, its transponder code is 0410 and it has an automatic altitude reporting transponder.

N48P, *lower right,* indicates a private plane flying VFR with no assigned altitude. It is assigned track number 11.

The tags on the bottom are held in readiness for aircraft not yet in the control area.

DEFINITION OF 'AIR TRAFFIC CONTROL' STUDIED

The FAA is receiving comments this month on its proposal to revise definitions for the terms "air traffic control" and "air traffic control clearance." The changes would clarify the respective responsibilities of pilots and controllers.

The proposed definition of "air traffic control" states the purpose of ATC as:

- Preventing collision in controlled airspace between aircraft being operated in accordance with special VFR or IFR without VFR restrictions.
- Providing for the safe, orderly and expeditious movement of air traffic operating in the vicinity of an airport with a functioning control tower.
- Assisting pilots operating aircraft in any airspace in the safe conduct of their aircraft operation.

The proposal would not alter the present concept of air traffic control whereby ATC is responsible for providing separation between IFR and special VFR aircraft, although pilots are required to look for and avoid other traffic when they are able to do so. VFR pilots would continue to have primary responsibility for maintaining separation between their aircraft and other traffic.

The definition proposed for "ATC clearance" would not substantially change the present definition which is an authorization issued by ATC for air traffic control purposes. However, clearances would be described as specifications of the conditions under which an aircraft is to be operated for air traffic control purposes. The term "ATC instruction" would be discontinued under the proposal.

FAA also proposes to change the rules covering compliance with ATC clearances to state that when immediate action is required for safety reasons, the clearance becomes effective when received by the pilot.

The proposed revisions in terminology would not change the actual operation of the ATC system. There would be no basic change in the present pilot-controller relationship.

Comments on the proposed rule changes will be accepted by FAA through July 20. They should refer to notice number 65-11 and be submitted in triplicate to the FAA, Office of General Counsel, Attention: Rules Docket, 800 Independence Ave., S.W., Washington, D. C. 20553.

MILESTONES IN AVIATION

On Sept. 9, 1912, Jules Vedrines, flying a *Deperdussin* monoplane powered by a 140 h.p. Gnome engine, won the Gordon Bennett Cup and set a world's speed record of 108.18 m.p.h. at Chicago. The fact that he broke the record—a significant feat in itself—is not nearly so important as the fact that the plane had a monocoque fuselage.

The monocoque fuselage, in which the skin (or shell) carries all or most of the load, proved far superior to the framework fuselage that was left open or covered over with wood or some textile material. It became the prototype for future aircraft manufacturers to follow. The pure monocoque fuselage structure had no longitudinal stiffening members which later became common, especially when metal structures came into use.

The first wood monocoque structure was designed in France by Ruchonnet and used by Bechereau in the *Monocoque Deperdussin*. (*American Heritage Publishing Co. and William J. Hammer collection of photographs.*)

Chemicals Tested to Determine Best Mixture to De-Ice Runways

Progress in the use of chemicals to remove snow and ice from airport runways at temperatures as low as −10 degrees was reported last month by the FAA.

Tests conducted under FAA contract by the Monsanto Research Corp., Dayton, Ohio, have shown that a mixture of 75 per cent tripotassium phosphate and 25 per cent formamide is the best mixture for melting snow, ice and slush on airport runways.

Nine de-icing chemicals were tested and then combined in various mixtures with corrosion inhibitors added to minimize the effects of chemical reaction on metal aircraft parts.

The mixture of tripotassium and formamide, both commercially available chemicals, was found to cause less corrosion than salt mixtures currently used. The product can be manufactured at a reasonable price and does not cause excessive damage to runway surfaces. In pellet form, this nontoxic mixture is applied at a rate equivalent to sand or salt applications on highways and may be spread with the same type of equipment.

Further tests on storage, application rates and the effects of the mixture upon concrete, rubber and grass will be conducted by the FAA before final recommendations are made for operational use.

These tests will be conducted this winter at the FAA's National Aviation Facilities Experimental Center near Atlantic City, N. J.

In the course of the tests, an inexpensive inhibitor was found that reduces the corrosive effects of salt on automobiles when added to the salt solution used on highways and airport access roads.

An estimated $900,000 was spent in the removal of snow, ice and slush from runways, taxiways and ramps at eight major airports during the 1962-63 season.

ASR Systems to be Modernized

A $342,500 contract has been awarded by the FAA to Texas Instruments, Inc., Dallas, for supplementary radar equipment to modernize 26 existing airport surveillance radar (ASR) systems.

ASR provides radar traffic controllers with position information on aircraft flying within 60 miles of the airport.

The new equipment, including parametric amplifiers, cross section sensitivity equipment and cross channel blankers, will raise operating performance of the 26 ASR-3 and -4 systems to the level of later model radars, ASR-5s and -6s.

CRITERIA FOR TERMINAL FACILITIES, SERVICES PUBLISHED IN HANDBOOK

Revised criteria for determining which airports are eligible for FAA terminal air navigation facilities and air traffic control services have been published in a new handbook titled *Airways Planning Standard Number One—Terminal Air Navigation Facilities and Air Traffic Control Services.*

The revised edition, for the first time, also provides activity "benchmarks" for making improvements to existing facilities and services.

The primary terminal air navigation facilities and associated air traffic control services which go to qualified airports are:

- Airport surveillance radars.
- Airport traffic control towers.
- Instrument landing systems.
- Terminal instrument approach systems.

There are many additional facilities and services which may be placed at qualified airports to aid in the control of air traffic. Some of these are:

- Automatic terminal information service.
- Combined stations/towers.
- ILS training installation.
- Runway end identification lights.
- Short approach light system.
- VOR test signal.

Uppermost in the minds of those who control the purse strings is to put the money, facilities and services where there is adequate traffic to justify the need, and where they benefit the greatest number of users for the lowest cost to the Government, consistent with safety and operational efficiency. This is of prime importance in carrying out that part of the Federal Aviation Act which empowers the administrator to provide necessary air navigation facilities and air traffic control services to insure efficient use of the navigable airspace and the safe and expeditious flow of air traffic. The planning standard assures this.

Airports qualifying for facilities include:

- Presently operating publicly owned airports, as defined in Section 2 of the Federal Airport Act, which meet certain criteria of activity.
- All publicly owned airports designated as regional airports, provided the forecasts of activity made by the FAA indicate that the criteria specified will be met within three years after the airport begins operation.
- Military facilities. FAA acquisition and operation of military facilities are covered by arrangements between the Department of Defense and FAA. No FAA facility is established where an existing military facility satisfies FAA operational requirements.

Privately owned airports are not eligible.

The criteria for determining which eligible airports get what is based on air traffic demand. For example, an airport with:

- 24,000 or more annual itinerant aircraft operations is a candidate for an air traffic control tower. Where an existing tower logs less than 18,000 annual itinerant operations, it becomes a candidate for decommissioning.
- 1,400 or more annual instrument approaches (or between 700 and 1,399 annual instrument approaches plus a supporting staff study) is a candidate for distance measuring equipment at an ILS. The discontinuance criteria is reached when annual instrument approaches fall to 400 or less.
- 700 or more instrument approaches plus adequate runway and lights is a candidate for an ILS which includes an approach lighting system with sequence flashing lights.
- 100,000 or more annual itinerant operations is a candidate for automatic terminal information service. Discontinuance criteria—75,000 or less.

D'Arcy Harvey, left, and William F. Druckenbrod of the Agency's Air Traffic Service, check IFR traffic flow on a peak day as they study possible locations for terminal facilities and services.

Other criteria are established for other facilities and services, but FAA does not regard any as rigid. There can be exceptions if the circumstances justify.

An airport that meets the criteria specified in the handbook is regarded as a candidate for a facility or service. It qualifies when:

- It meets the criteria specified for three consecutive FAA annual counts. (An FAA annual count is a summary of activity for a fiscal year or calendar year. Where actual traffic counts are unavailable or not recorded, adequately documented FAA estimates of the demand for the facility or service may be used.)
- It is recommended by a regional director as being necessary to satisfy an operational requirement and is economically justified by a cost-benefit study.
- The administrator agrees with the recommendation of the regional director.

Prior to the start of surveys or construction for the establishment of a new facility or service, the FAA will reexamine the basis on which the project was justified. If the eligibility factors have changed or are expected to change significantly, such as discontinuance of air carrier service, closing of a military base, new airport plans, etc., the region advises the Washington office of the change.

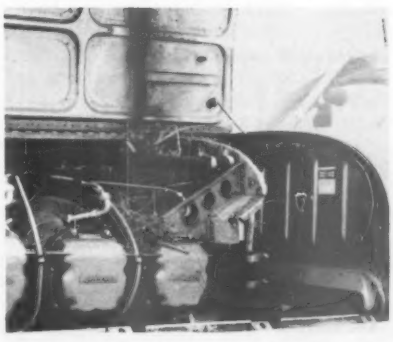
Copies of the handbook are available free from the FAA Distribution Section, HQ-438, Washington, D. C. 20553.

Do You Lift Cowling When Preflighting Your Plane?

The Beechcraft *Debonair* A33 looked all right to Wallace W. Rose as he made a walk-around inspection prior to his annual FAA flight check. But when he opened the engine cowling, a point often overlooked in preflighting airplanes, he found a bird's nest on top of the engine big enough to support a small chicken.

A member of the FAA's air traffic division evaluation and investigation staff in Kansas City, Mo., Rose reported there were bits of straw, pencil, wood chips, string and filter tip cigarette butts in the nest—nice kindling for a fire.

Rose said that the only way for a bird to get into the engine compartment would be to worm its way up through



the wheel well. At any rate, Rose is now a confirmed cowling lifter.

NEW 'AVIATION WEATHER' BOOK WILL HELP PILOTS UNDERSTAND ELEMENTS

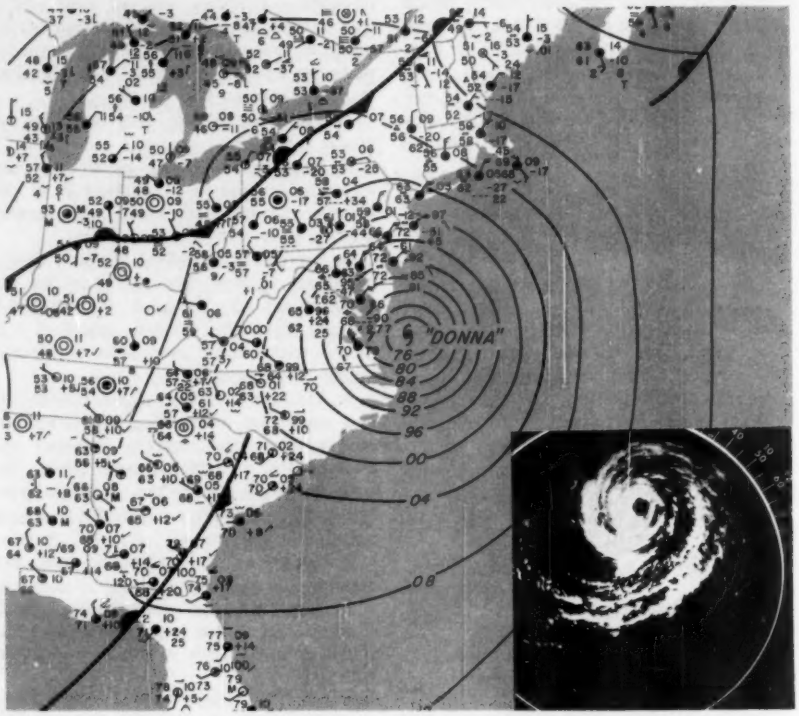
While no one is still doing very much to change the weather, pilots at least now can obtain more weather information to talk about.

Although they do not need to be trained meteorologists to fly, pilots should know something about the behavior of weather and how it affects flying.

The FAA and the Weather Bureau of the Commerce Department recently published a comprehensive study of all the important meteorology advances which have taken place in the past decade. The study is colorfully illustrated by almost 200 photographs and drawings in a 299-page book titled *Aviation Weather.*

For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402, for $2.25 a copy, the book tells of the various aspects of weather which could be encountered by pilots.

The weather manual is divided into 22 chapters on the Earth's Atmosphere, Temperature, Atmospheric Pressure, Wind, Moisture, Stability, Turbulence, Clouds, Air Masses, Fronts, Thunderstorms, Icing, Common "IFR" Producers, the Nation's Aviation Weather System, Weather Observations, Weather Charts, Aviation Weather Forecasts, Using and Helping the Weather Service, High Altitude Weather, Arctic Weather, Tropical Weather and Soaring Weather.



Some of the larger hurricanes have a diameter up to about 1,000 square miles with destructive winds up to 500 miles in diameter. Illustrations from *Aviation Weather* show "Donna" as seen on a radar scope at Key West, Fla., and on a surface weather chart two days later off the Virginia coast.

MECHANICS SAFETY AWARDS PROGRAM IMPROVED

Experience gained in the first two Annual Aviation Mechanic Safety Awards Programs has prompted changes which will be incorporated into the program.

One of these will be to offer all winners a tuition-free maintenance training course of their choice at the FAA Academy in Oklahoma City. Negotiations are under way with industry and state aviation officials to provide transportation, room and board.

Another change includes the award of metal replicas of FAA mechanic certificates to state and regional winners from the Champion Spark Plug Co.

In order to bring the program up to date and to permit the submission of current maintenance developments, the 1965 program will be expanded to include ideas developed during 1964 and 1965, with entries accepted through Dec. 31, 1965. State winners will be honored in February 1966. Regional awards will be presented in March and the national awards in April.

The awards program, a joint effort of the FAA, the Flight Safety Foundation and the aviation community, gives recognition to aviation mechanics who make outstanding contributions to air safety.

In the general aviation category, each state winner will become eligible for one of the seven regional plaques. The names of the regional winners will go to the Flight Safety Foundation where a committee will select the general aviation national winner who will receive a specially created medallion from the FAA Administrator in Washington.

Due to the geographic location of air carrier headquarters, no state awards will be given in this category. The national air carrier winner will be selected from among eight regional winners, including the European region, and awarded a medallion in the same manner as the general aviation winner.

Regional and national awards are donated by American Aviation Publications, Inc.

New Publications Available

Several new FAA publications are now available to the public. Those marked "free," are available from the FAA, Distribution Section, HQ-438, Washington, D. C. 20553; "for sale" items are available from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.

The publications include:

- *Airport Activity Statistics of Certificated Route Air Carriers,* a joint publication by the FAA and the Civil Aeronautics Board containing the volume of passengers, freight, express and mail traffic for fiscal 1964; GPO, $1.75.
- *Sixth Annual Report.* FAA's report to the President and the Congress for fiscal year 1964; GPO, 50 cents.
- *Enroute IFR Air Traffic Survey—Peak Day, Fiscal '64;* FAA, free.
- *Enroute IFR Air Traffic Relationships, Fiscal '64;* FAA, free.
- *Selling to FAA,* contains the how, what and where the FAA buys; FAA, free.

HALABY, McKEE AT INAUGURATION OF FAA HELIPORT

It was shirtsleeve weather in Washington when Najeeb E. Halaby, right, Gen. William F. McKee and six former administrators of the Agency joined in the inaugural flight from the FAA helipad. The photo below was taken from the building south of FAA headquarters.

At the request of the administrator, a Washington National Airport fireman, John Dant, demonstrates the foam gun. Some 4,000 gallons of water and two 130-gallon bladders of foam are part of the fire fighting equipment kept permanently at the helipad site.

The feasibility of rooftop landings in downtown Washington was demonstrated last month with Government aviation administrators representing the past, present and future in attendance.

FAA Administrator N. E. Halaby played host to Gen. William F. McKee, who has been named as his successor, and six men who served as administrator since World War II.

The landings also inaugurated the FAA's 160 by 65 foot helipad which can be used to enable Government officials to make speedy trips during emergencies.

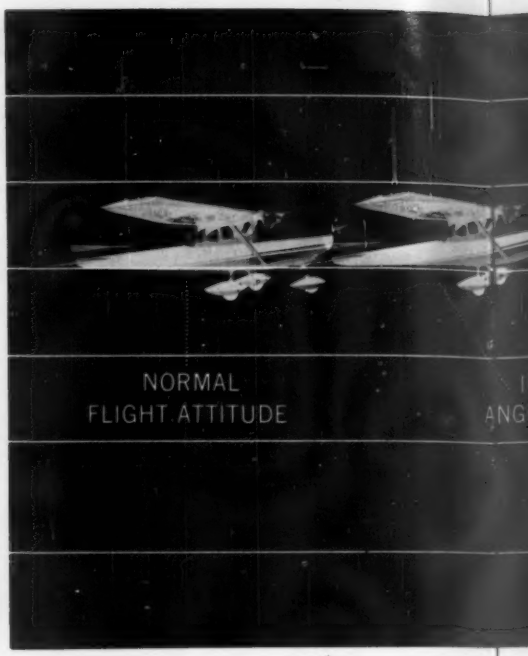
Not having a chopper of its own, the Agency rented the 10-place craft used in the flight from Bell Helicopter Co., and Halaby joined Leonard Arrick, Bell test pilot, up front at the controls.

The administrator has frequently pointed out that the intercity traveller is really concerned with "stoop-to-stoop" time—that is, for example, the time it takes the businessman to get from his Washington office to the office he plans to visit in New York City—not the time it takes to fly from one airport to another. He predicted that intercity commercial service by helicopter would become a reality soon.

While FAA's heliport is designed for emergency Government use, the administrator noted that heliports could be located on other downtown buildings in Washington, including Union Station, when city-center to city-center flying develops.

SAFETY FIRST

QUIT YOUR STALLING!



Approximately 80 per cent of all fatal general aviation accidents are caused by the pilot, according to the FAA. The breakdown on fatal accidents indicated that a major cause is pilot failure "to maintain air speed (flying speed) resulting in a stall."

While many stalls have occurred during periods of stress when a pilot was in trouble (disoriented, for example), an analysis of written examinations indicates a lack of understanding of what can cause or contribute to a stall.

First and foremost is the fact that an airplane can be stalled at any air speed in any attitude if the critical angle of attack is exceeded, and the pilot applies abrupt or excessive back pressure on the elevator control.

There are, of course, other factors that contribute to stalls. They include:

- Weight of the airplane.
- Load factor.
- Changes in altitude.
- Angle of bank.
- Ice, frost or snow accumulation.
- Turbulence.

When the weight of an airplane is increased, so is the stall speed. A greater angle of attack must be maintained to produce additional lift to support the additional weight in flight. Therefore, the aircraft's critical angle of attack requires a higher air speed when it is loaded to maximum gross weight than when it is flown solo with no baggage.

For all practical purposes, the *indicated* stalling speed remains the same regardless of the altitudes normally used by general aircraft. The same indicated air speed should be maintained during the landing approach regardless of the elevation or the density altitude at the airport. In this regard, follow the manufacturer's recommendation. If a higher than normal approach air speed is used, a longer landing distance will be required.

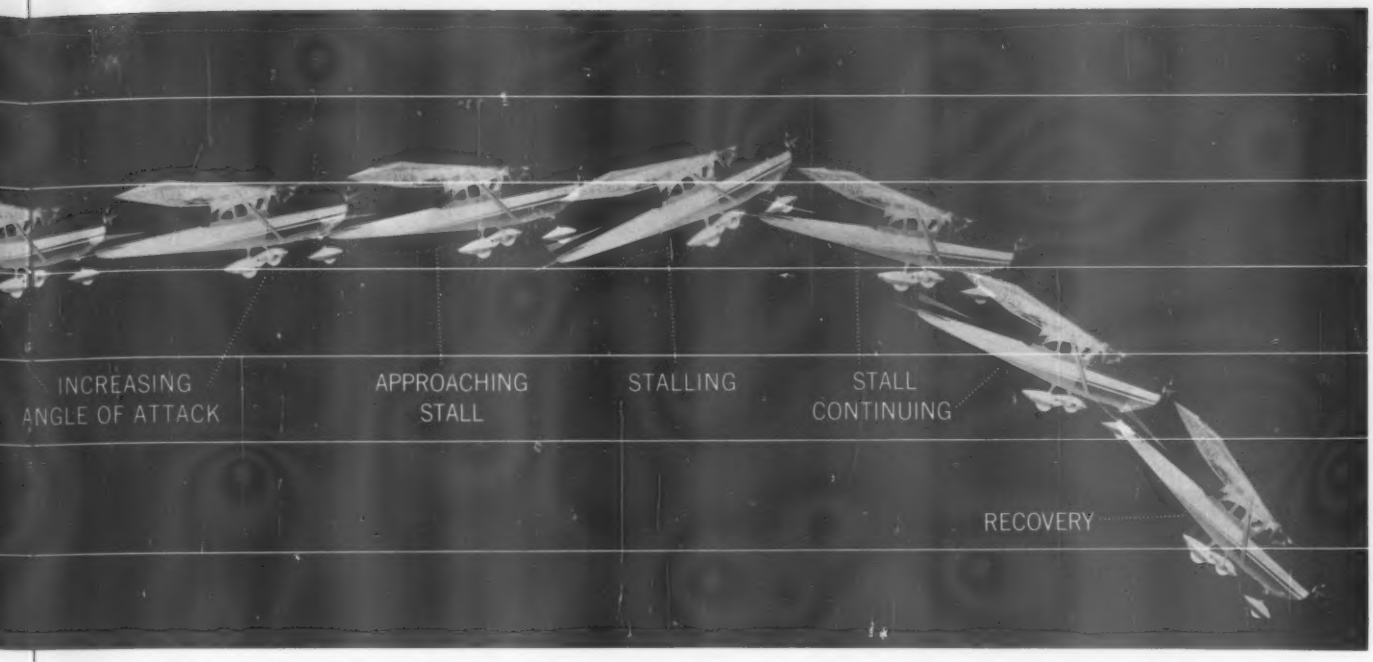
True air speed normally increases as altitude increases. When it does, the chance of stalls also increases. This is significant when landing at higher elevations or under higher density altitudes, because pilots operate at higher true air speeds (and therefore, higher ground speeds) throughout the approach, touchdown, and landing roll. This results in a greater distance to clear obstacles during the approach, a longer ground roll and, consequently, the need for a longer runway. If, in addition, the pilot is operating under the misconception that a higher than normal indicated air speed should be used under these conditions, the situation is compounded by the additional increase in ground speed.

Angle of bank also affects stalling speed. As the angle is increased in a constant altitude turn, the stalling speed increases. At a 60-degree bank, stalling speed is 40 per cent greater than in straight-and-level flight. At angles of bank above 60 degrees, stall speed increases very rapidly, and at approximately 75 degrees it is doubled with respect to straight-and-level stall speed.

Any maneuvering of an airplane that produces an increase in centrifugal force will cause an increase in load factor which, in turn, affects stalling speed.

A pilot can recognize this increase in load factor by feeling his body weight increase or by the feeling that he is being forced down into the seat—the feeling you get on a roller coaster when at the bottom of a dip or going around a banked curve. This feeling of increased body weight is important to the pilot because it should, if it becomes excessive, have the immediate effect of a red flag being waved in his face to warn him that the airplane will now stall at a higher air speed. If the limit load factor is exceeded, the result can be structural failure.

You can reduce stalling speed by the use of flaps. This can be readily verified by checking the color coding on any air speed indicator. The lower air speed limit of the white



arc (power-off stalling speed with gear and flaps in the landing configuration) is less than the lower air speed limit of the green arc (power-off stalling speed in the clean configuration). This is important to the pilot in that when making no-flap landings a higher indicated air speed should be maintained than when landing with flaps. Again, the manufacturer's recommendations as to approach speeds with various configurations should be followed carefully.

An accumlation of ice on wing or tail surfaces can cause a significant increase in stalling speed. While this is a rare phenomenon during summer months, the hazard will increase when the weather turns cold. An accumlation of frost, snow or ice on the wings can disrupt the smooth flow of air over the wings and decrease lift, thus interfering with take-off.

Turbulence can cause a large increase in stalling speed. Encountering an upward vertical gust causes an abrupt change in relative wind. This results in an equally abrupt increase in angle of attack which could result in a stall.

The areas in which stalls are found to be most critical are during take-off and departure, approach to landing and accelerated maneuvers. When the angle of attack is increased too rapidly, it causes an aircraft to stall at a higher speed than in normal flight. The angle of attack is increased by the additional load factor that results from a steep turn or abrupt pull-up.

The properly trained pilot will be able to recognize promptly the first physical symptoms of stalling. When he seeks to recover, he should not exceed normal cruising airspeed at any time, and he should be able to recover without any undue loss in altitude.

Recommended stall recovery procedure is to return the aircraft to straight and laterally level flight by coordinated use of all flight and power controls. The angle of attack should be relieved smoothly by relaxing pressure on the elevator control. Control effectiveness should then be regained with the least loss of altitude consistent with safety.

If an airplane is stalled during a turn, proper recovery should include stopping the turn first, then proceeding with coordinated recovery procedures.

While many modern aircraft are designed to recover from a stall, the FAA recommends that pilots become proficient in stall recovery through practice after proper instruction on how to recover from both straight and turning stalls.

The best insurance against unintentional stalls is prompt recognition and proper control. Pilots should know that stalls are caused by exceeding the critical angle of attack and, further, they should know what factors contribute to this condition and cause the angle of attack to be exceeded.

STALL SPEED, POWER OFF

Gross Weight 3000 lbs. – Speeds are MPH, TIAS*

	ANGLE OF BANK			
CONFIGURATION	0°	20°	40°	60°
Gear and Flaps Up	65	67	74	92
Gear Down, Flaps 20°	61	63	70	86
Gear Down, Flaps 40°	60	62	69	85

*True Indicated Air Speed identical with Calibrated Air Speed.

Polar bears killed by Arctic hunters are skinned on the ice; only the fur is brought home. Above, Ernest M. Crump, FAA's chief air traffic control specialist in Kotzebue, stands by as the flight plan of a hunter is recorded.

ARCTIC HUNTERS FILE FLIGHT PLANS —JUST IN CASE

Hunting polar bears in a light aircraft over the rugged ice cap north of the Arctic Circle may sound a bit hazardous to flat country flyers, but Alaskan bush pilots have equalized the odds through know-how and safety practices.

"No pilot flying out on the ice would be caught dead without filing a flight plan," according to Ernest M. Crump, chief air traffic specialist in FAA's remote flight service station in Kotzebue—a village of 1,800 Eskimos on the west coast of Alaska where the North American continent brushes against Siberia.

Pilots file their flight plans with the FSS either in person or by radio, carefully giving information that might be helpful to a search party—just in case. The strategy is not only to avoid trouble, but to minimize any difficulties the flying hunters may encounter.

At dawn's first light, scouts and hunters prepare their aircraft as well as their gear for the long day's hunt. They are especially careful about preheating their aircraft. At 6:15 and 7:15 each morning they tune in the Kotzebue beacon frequency for a briefing on weather conditions in the hunt area on the ice pack between Siberia and Alaska.

Using the "buddy system," the hunters fly in pairs over the ice in rectangular patterns while seeking out breaks in the ice where the polar bears prey upon seals and walruses that sun themselves on the ice floes. They watch carefully for the shadows of the bears against the snow and ice. Cruising at 75 knots, the hunters usually cannot actually see the bears themselves when they are camouflaged against the white terrain.

Using the "bush frequency," the pilots keep in touch with the FSS as the day progresses. FSS monitors the frequency and follows the progress of each flight, keeping constantly on the alert to any request for assistance.

Assistance may take many forms. There have already been a dozen saves this season of pilots who were blown off their course and unable to find their way back to Kotzebue. The specialists, pilots themselves, help the lost flyer with terrain identification and give him bearings to fly home. They may contact the U. S. Air Force radar stations in the area for a pinpoint fix on the aircraft.

If an aircraft fails to make it back, the specialists at the FSS crank up the search-and-rescue machinery and join the flying search missions when they are not on watch.

What do the flyers think about the services they receive? A recent letter from pilot Jeff Brown gives a typical comment:

"Having been engaged in guiding polar bear hunters on the polar ice pack for the past three years, I have had unlimited contact with 'Kotzebue Radio.' In my opinion, shared by all the guides, 'Kotzebue Radio' is the most outstanding FAA station in Alaska . . . . Because of the high proficiency of the personnel at this station, many accidents have been avoided and many lives have been saved."

When the long hunting day is over, and the last aircraft is tied down for the night, the specialists often go into town to swap stories with the pilots about the day's hunt. There is talk about the big bear that got away, and there usually is some airplane talk too—how the hunt missions can be made even safer.

RULES OF THE ROAD

Don't Create Collision Hazard

Know Right-of-Way Rules

This is the fifth in a series on "Rules of the Road."

The rules governing right-of-way in the air are the basic "rules of the road" for aircraft. They are based on an elementary principle of physics—that two objects cannot occupy the same space at the same time.

But one doesn't have to be a physicist to understand that when two bodies are moving on collision or near-collision course, one must give way. Part 91 of the *Federal Aviation Regulations* ("General Operating and Flight Rules") addresses itself specifically to this point.

"Aircraft in distress" are given the right-of-way over all other air traffic by Part 91, which also states that when an aircraft has the right-of-way no other aircraft may pass over, under or ahead of it unless well clear.

In cases where aircraft of the "same category" are on converging (but not approximating head on) courses at the same altitude, the rule specifies that the aircraft to the other's right has the right-of-way. Where aircraft of "different categories" are involved:

- A balloon has the right-of-way over any other category of aircraft.
- A glider has the right-of-way over an airship, airplane or rotorcraft.
- An airship has the right-of-way over an airplane or rotorcraft.

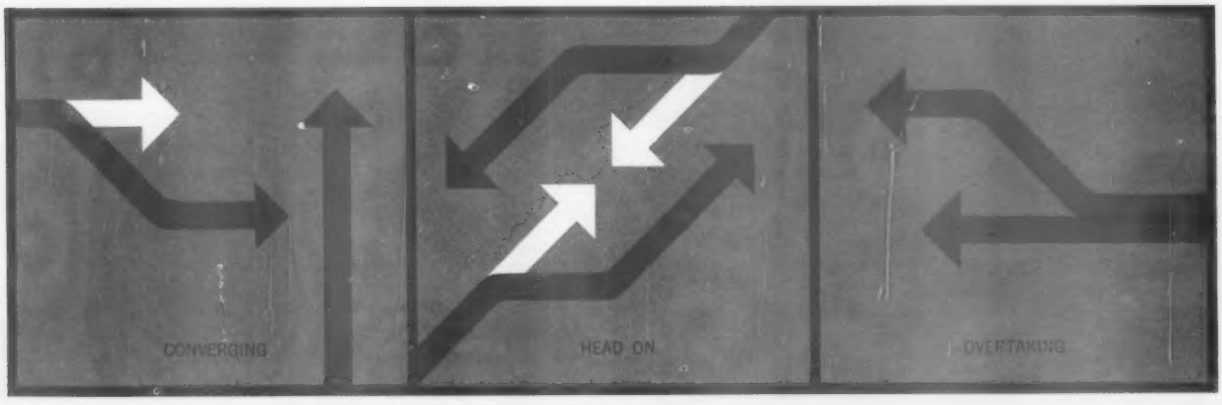
However, the rule gives an aircraft that is towing or refueling another aircraft the right-of-way over all other engine-driven aircraft.

When two aircraft are approaching head on, or nearly head on, each pilot is required to alter course to the right. A pilot of an aircraft overtaking another aircraft also is required to alter course to the right in order to pass well clear of the slower plane.

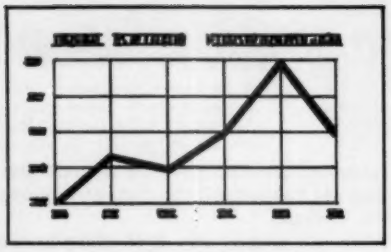
During landing operations, aircraft on final approach have the right-of-way over other aircraft in flight as well as those operating on the surface. When two or more aircraft are approaching an airport, the aircraft at the lower altitude has the right-of-way over the others. However, it may not take advantage of this to cut in front of another aircraft which is on final approach or to overtake that aircraft.

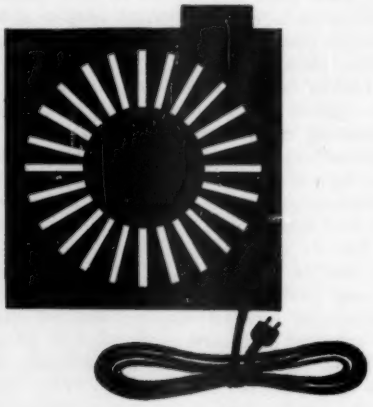
Part 91 further states "no person may operate an aircraft so close to another aircraft as to create a collision hazard." It also prohibits formation flying by aircraft carrying passengers for hire and requires that all other formation flying be arranged with each of the pilots involved.

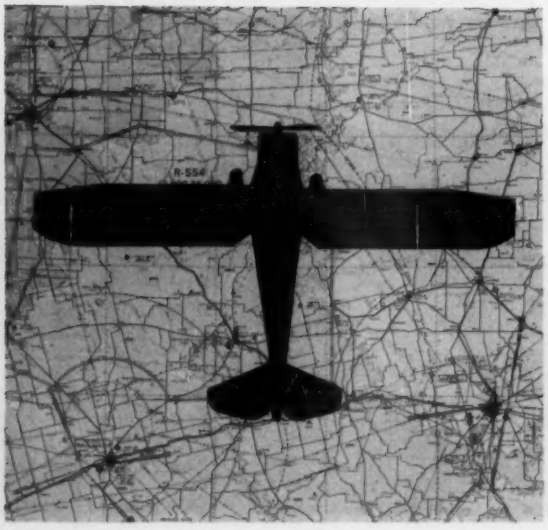
When operating aircraft on the water, the marine rules for the operation of vessels apply. They are similar in many respects to the right-of-way rules of the air. One distinct exception is when overtaking another aircraft or vessel on the water, the pilot must alter his course to keep well clear and this may or may not be to the right, depending on the circumstances.



SAFETY FIRST SERVED S







Tragic and costly aircraft accidents are a constant concern of the Federal Aviation Agency. While the precise accident rate for general aviation can only be a matter of educated calculation inasmuch as pilots are not required to report their total flying hours, the FAA knows the deadly seriousness of the problem.

Although there is some disagreement over whether the rate is increasing or decreasing, the FAA knows that there are several general aviation accidents nearly every day of the year with an average of more than two deaths every 24 hours. The FAA should know—it participates in the investigation of every accident.

Various studies point out the high toll extracted by poor weather, the surprising frequency with which a dead pilot is found to have alcohol in his blood, the failure to understand stalls (*pages 8-9*), to isolate just a few problem areas. But the vast majority of all causes can be brought under three headings—lack of knowledge, faulty flying techniques and

Douglas B. Moore, left, Atlanta general aviation operations inspector, and flight instructor Kenneth Nesbitt carefully review the steps a pilot should follow while preflighting his aircraft. Above, Moore explains in detail why the oil check is so vital to aviation safety and stresses the importance of teaching such safety precautions to all student pilots. Right, the two men check the operation of the aircraft aileron.

SOUTHERN STYLE

carelessness. As Administrator N. E. Halaby put it, "Aircraft don't get caught in weather, they are flown into it." Only a comparatively small percentage of accidents are due to mechanical failures and a much smaller number to structural defects. About 80 per cent of all fatal accidents result from some act of a pilot.

Knowing these facts, the FAA General Aviation District Office in Atlanta is now engaged in an all-out safety education campaign in an attempt to reduce the accident rate in the Agency's Southern Region. More than 10,000 of the 87,000 active general aviation aircraft in the United States are based in that region which has more than 60,000 licensed pilots.

The Atlanta GADO inspectors have made the flight instructor their prime target. Through him, they hope to reach and teach safe flying habits and procedures to student pilots at the very beginning of their training. The secondary objective is to reach all active pilots in the area.

To reach these pilots, a well-organized campaign was designed to promote attendance at day-long meetings. Before each safety session, attractive posters were distributed to fixed-base operators, private industries and others within a 50-mile radius of each meeting site. Dozens of explanatory letters appealing for support were sent out and local news media and FAA area coordinators were enlisted to publicize the meetings.

To date, successful sessions have been held in various Georgia cities—at Savannah, Macon, Atlanta, Augusta, Rome, Columbus and Albany. Additional meetings are planned.

Most of the daylight hours of a typical 9 to 9 meeting are devoted to standardization flights for instructors. Proficient FAA inspectors take the instructors aloft in their own aircraft and go through such maneuvers as take-offs, approaches, landings and traffic pattern flying. The demonstrations, intended to standardize techniques, have practical side benefits inasmuch as they are the same maneuvers instructors are asked to execute when they are given their proficiency check rides by FAA inspectors.

During the evening session, the FAA program includes slides, charts and working models of such things as an instrument landing system and a visual glide slope indicator. Presentations are made on such subjects as traffic patterns, landing attitudes, accident rates and their causes, preflight and weather information, and check lists. Still others show, in brutal detail, just what an airplane looks like after crashing, burning and, too often, snuffing out the lives of an entire family. FAA appeals for support for a continuous, effective accident prevention program and points out the many FAA services available for the asking. The meetings usually conclude with a "no-holds-barred" questions-and-answer session.

Each pilot is presented a safety kit including useful information on weather, navigation and flight procedures in critical accident areas. Lists and order forms are included so that pilots may order educational materials developed by the FAA as well as the *Federal Aviation Regulations*.

Above, inspectors Moore and Robert T. Smith photograph a diagram for the slide presentation part of the safety conferences. Below, Moore and Nesbitt, a flight instructor from Atlanta, check the instrument panel of their aircraft before taking off on a standardization flight.

Accidents Don't Just Happen . . . Pilots Cause Them

The man flying the aircraft is the major cause of general aviation accidents. Recent studies of these accidents not only confirm this fact, but also give a deeper insight into the more specific causes.

The accompanying charts, now being used in the form of slides at FAA safety presentations, depict pilot factors, weather factors and the effect of recent flying experience on accident rates.

In order to evaluate the performance of pilots, the FAA studied the medical records of flyers for the two-year period preceding May 1, 1964, and correlated the information with accident statistics gathered by the Agency for the last six months of 1963.

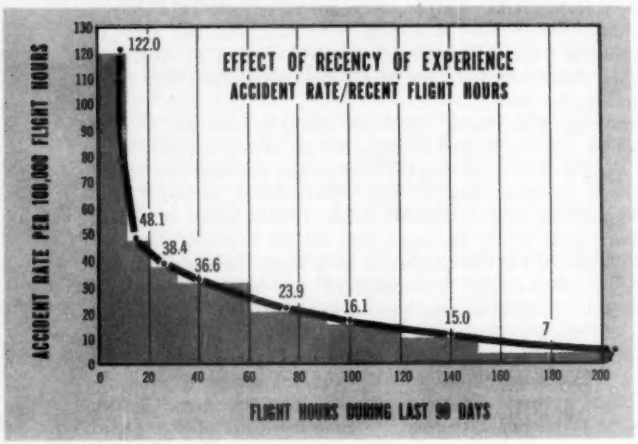
Inasmuch as the Government does not require pilots to secure annual licenses, submit annual reports or even keep logs, FAA officials do not regard their figures as positively accurate. But they point out that the figures are based on careful studies by experienced people using all available data.

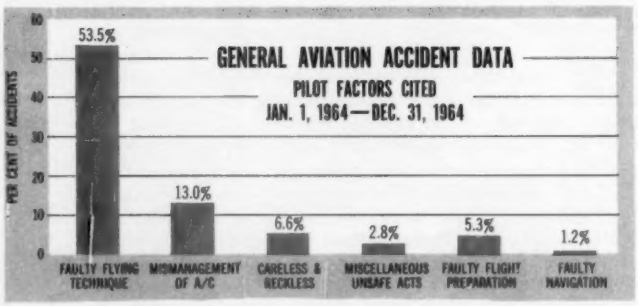
While they do not doubt that a more demanding reporting system might change some figures, they are convinced that the chart of "Effect of Recency of Experience," for example, is generally sound, correctly reflecting a situation in which a pilot with 160 hours of flying time within a given 90-day period is about 18 times safer than a pilot who has logged less than 10 hours.

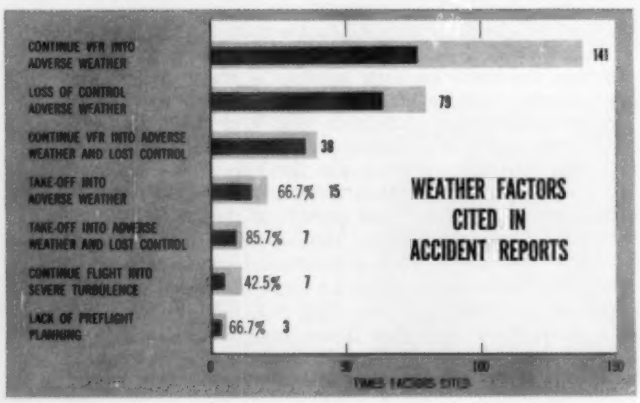
The FAA investigates the bulk of general aviation accidents under authority delegated by the Civil Aeronautics Board and is confident of the figures in the charts involving weather and pilot factors. The major pilot factor is "faulty flying technique"—an area where conscientious pilots can easily improve with the help of competent instructors. It should be noted that more than one cause may be cited for an accident.

Bad weather plays a very significant role in many general aviation accidents, but this usually does not absolve the pilot since he often deliberately flies into it.

In 1964 there were some 500 fatal accidents and the bottom chart indicates that weather played a significant role in a very large number. Continued VFR flight into adverse weather was the cause of 141 accidents in 1964 and most of them involved fatalities. Again, in some instances more than one factor was attributed to an accident and some categories overlap.







Letters

FAA

FAA Aviation News welcomes comments from the aviation community. We will reserve this page for an exchange of views. No anonymous letters will be used, but initials will be withheld on request.

• Pilot Examiner

For the past three years my application for a Designated Pilot Examiner's rating has been on file at the Federal Aviation Agency office at Oakland Airport.

I have over 5,000 hours of flight time with over 4,500 hours as a flight instructor. I have a flight instructor's rating, a commercial license, an instrument and instrument instructor's rating, a basic ground instructor's rating and an instrument ground instructor's rating.

Will you send me the details on how to obtain this designated Pilot Examiner's title? Is there a written examination?

Initials withheld
San Jose, Calif.

Applications, as such, are not accepted for designation as a Pilot Examiner. Candidates are selected by the Supervising Inspector of the district office involved when he determines that an additional examiner is needed to provide service to the public at a specific location. Although minimum qualifications for designation have been established, compliance with these requirements does not ensure designation. No written examination is required.

• Which Is Safer?

I would like a clarification on something relative to flying. Could you tell me which is safer to fly, a conventional plane or a helicopter?

R. E. P.
Atlanta, Ga.

No general statement can be made as to which is safer. While accident data is available, incorrect conclusions could be reached if one does not give full consideration to the type of operations and the pilots involved.

As of Jan. 1, 1964, there were 87,267 active aircraft registered with the FAA; only 1,190 were helicopters. During calendar year 1963, there were 4,859 accidents in general aviation operations. Of these 181 involved helicopters. While the accident rate for helicopters is considerably higher than that of other general aviation aircraft, helicopters are far more frequently engaged in flights demanding considerable skill, often flying in and out of small areas. It is not meaningful to compare such flights to those for simple transportation between two points.

On the other hand, helicopters are frequently flown by unusually well-qualified pilots, men who have had long experience flying military helicopters. If there were as many helicopters in operation as other general aviation aircraft, with the same percentage flown by inexperienced pilots, the accident rate could be expected to reflect this.

Also, all type certificated aircraft, including helicopters, must meet basic airworthiness, performance and flight characteristic standards. With respect to the requirement for flight characteristics, these are established to accommodate the pilot with average skill.

• Likes May

As a subscriber of *FAA Aviation News* for a number of years, I have read many interesting and informative articles which I have passed on to our flight and design personnel. All issues of your fine publication have been most worthwhile; however, your May 1965 issue takes first prize for being packed with worthwhile safety information from cover to cover. The purpose of this letter is merely to say two words: "Thanks" and "congratulations."

D. K. Warner
Flight Safety Coordinator
North American Aviation, Inc.

• More on Wing Load

Regarding the letter titled "Wing Load" in the May issue of *FAA Aviation News:*

For years I have been under the impression that a down load on tail surfaces of conventional aircraft is necessary to produce a stable pitching movement, i.e., aircraft will tend to nose up from a dive as air speed increases and level off from a climb as air speed decreases. Is this not true?

A. C. M.
Scotts Mills, Ore.

It is true that most designers of light airplanes use a down load on the horizontal tail surfaces to provide the longitudinal stability you describe. It is not, however, necessary in all designs to have a down load on the horizontal tail in order to achieve longitudinal stability.

Stability in pitch is dependent on the over-all design of the aircraft and can be affected by many factors such as the relationship of the line of thrust to the center of gravity and to the center of drag, and the center of pressure travel characteristic of the wing airfoil. Generally, a conventional airplane is more stable with a forward loading than with an aft loading.

The section in the Flight Instructor's Handbook *to which the letter in* FAA Aviation News *refers is directed toward the flight instructor, not the airplane designer. It points out that the most efficient performance of a certificated airplane will be achieved when it is loaded so that the indicator on the elevator (or "stabilator") trim setting is near neutral during cruising flight. Loading which requires a trim setting on either the "nose up" or "nose down" side of neutral will result in a less efficient performance. A trim setting on the "nose up" side will result in a greater decrease in performance than will an equal amount of "nose down" trim.*

• Flying Undertaker

I receive a salary from a funeral home as an embalmer and funeral director. The corporation owns an airplane for carrying corpses to and from various cities. Can I, as a private pilot, fly them for the corporation if it doesn't increase my pay? I am not being paid for flying, but as a licensed funeral director and embalmer.

Initials withheld

A clarification of private pilot privileges was issued by the Agency in the form of amendment 61-8 to FAR 61 which became effective May 4, 1964. The rule now states in part that although a private pilot may not carry passengers or property for compensation or hire, he may otherwise act as pilot-in-command of an aircraft for compensation or hire in connection with any business or employment if the flight is only incidental to it. Therefore the carrying of bodies by you, as an embalmer and funeral director with a private pilot license, is permissible.

• Student Pilot Activities

My husband is a private pilot and has been checked out flying in the right seat by a certified flight instructor. I am a student pilot. To augment my hours of instruction with a certified instructor, is there any reason why I cannot fly with my husband for practice purposes only?

Mrs. H. B.
Sandusky, Ohio

The FARs do not prohibit student pilots from riding as passengers with certificated pilots, even if the student pilot handles the flight controls. However, the FAA does not recommend this practice as a means of increasing the student's proficiency.

The requirements for a private pilot certificate only permit the recognition of flight instructions given by a certificated flight instructor and solo flight time. No other flying experience will be credited toward the requirements for a private pilot certificate. A certificated pilot who does not hold a flight instructor certificate has never established his ability to give effective instruction, or to provide accurate appraisals of inaccurate or inept flight performances. His comments or corrections could be detrimental, rather than helpful, to a student's progress. We suggest that you consult your flight instructor concerning the type of flying you propose, because he is in the best position to judge its effect on your progress.

We believe that directed solo practice would provide a much more efficient and effective use of flight time.

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Hairy landings have to go;

Take some dual from a pro.